

**Fire and Emergency Services Higher Education Conference
June 2 – 4, 2001**



***Fire-Related
Associate's Degree***



**COURSE DESCRIPTIONS AND LEARNING OUTCOMES
FOR CORE COURSES IN THE MODEL PROGRAM
FOR THE ASSOCIATES DEGREE**

Fundamentals of Fire Protection
Fundamentals of Fire Prevention
Fire Protection Systems
Fire Behavior and Combustion
Fire Protection Hydraulics and Water Supply
Building Construction for Fire Protection

Developed at the
Fire Service Higher Education Conference
National Fire Academy
June 2 and 3, 2001

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| Name: | Fundamentals of Fire Protection |
| Course Description: | Provides an overview to fire protection; career opportunities in fire protection and related fields; philosophy and history of fire protection/service; fire loss analysis; organization and function of public and private fire protection services; fire departments as part of local government; laws and regulations affecting the fire service, fire service nomenclature; specific fire protection functions; basic fire chemistry and physics; introduction to fire protection systems; introduction to fire strategy and tactics. |
| Prerequisite: | None |
| Outcomes: | <ol style="list-style-type: none"> 1. Describe and discuss the components of the history and philosophy of the modern day fire service. 2. Analyze the basic components of fire as a chemical reaction, the major phases of fire, and examine the main factors that influence fire spread and fire behavior. 3. Differentiate between fire service training and education; fire protection certificate program and a fire service degree program; and explain the value of education in the fire service. 4. List and describe the major organizations that provide emergency response service and illustrate how they interrelate. 5. Identify fire protection and emergency-service careers in both the public and in the private sector. 6. Synthesize the role of national, state and local support organizations in fire protection and emergency service. 7. Discuss and describe the scope, purpose, and organizational structure of fire and emergency service. 8. Describe the common types of fire and emergency service facilities, equipment, and apparatus. 9. Compare and contrast effective management concepts for various emergency situations. 10. Identify and explain the components of fire prevention including code enforcement, public information, and public and private fire protection systems. |
| References: | |
| Assessment: | Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor. |

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| Name: | Fundamentals of Fire Prevention: |
| Course Description: | Provides fundamental information regarding the history and philosophy of fire prevention, organization and operation of a fire prevention bureau, use of fire codes, identification and correction of fire hazards, and the relationships of fire prevention with built-in fire protection systems, fire investigation, and fire and life-safety education. |
| Prerequisite: | None |
| Outcomes: | <ol style="list-style-type: none"> 1. Define the national fire problem and main issues relating thereto. 2. Recognize the need, responsibilities, and importance of fire prevention as part of an overall mix of fire protection. 3. Recognize the need, responsibilities, and importance of fire prevention organizations. 4. Review minimum professional qualifications at the state and national level for Fire Inspector, Fire Investigator, and Public Educator. 5. Define the elements of a plan review program. 6. Identify the laws, rules, codes, and other regulations relevant to fire protection of the authority (ies) having jurisdiction. 7. Discuss training programs for fire prevention. 8. Design media programs. 9. Discuss the major programs for public education. |
| References: | |
| Assessment: | Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor. |

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| Name: | Fire Protection Systems |
| Course Description: | Provides information relating to the features of design and operation of fire detection and alarm systems, heat and smoke control systems, special protection and sprinkler systems, water supply for fire protection and portable fire extinguishers. |
| Prerequisite: | Demonstration of a competency in high school level algebra or the equivalent. Completion of Fire Protection Fundamentals or instructor approval. |
| Outcomes: | <ol style="list-style-type: none">1. Articulate knowledge of distribution and installation of water supply systems in suburban and rural areas2. Comprehend types, components, and operation of automatic, special sprinkler systems, and standpipes.3. Classify detection, alarm, supervisory devices, heat, flame, smoke control devices and hardware.4. Identify and describe appropriate national standards governing the installation , inspection, and maintenance of given extinguishing agent/systems and their related components. |
| References: | |
| Assessment: | Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor. |

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| Name: | Fire Behavior and Combustion |
| Course Description: | Explores the theories and fundamentals of how and why fires start, spread, and are controlled. |
| Prerequisite: | None |
| Outcomes: | <ol style="list-style-type: none">1. Identify physical properties of the three states of matter2. Categorize the components of fire.3. Recall the physical and chemical properties of fire.4. Describe and apply the process of burning.5. Define and use basic terms and concepts associated with the chemistry and dynamics of fire.6. Describe the dynamics of fire.7. Discuss the various materials and their relationship to fires as fuel.8. Demonstrate knowledge of the characteristics of water as a fire suppression agent9. Articulate other suppression agents and strategies.10. Compare other methods and techniques of fire extinguishments. |
| References: | |
| Assessment: | Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor. |

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| Name: | Fire Protection Hydraulics and Water Supply |
| Course Description: | Provides a foundation of theoretical knowledge in order to understand the principles of the use of water in fire protection and to apply hydraulic principles to analyze and to solve water supply problems. |
| Prerequisite: | Demonstration of a competency in high school level algebra or the equivalent. |
| Outcomes: | <ol style="list-style-type: none"> 1. Apply the application of mathematics and physics to the movement of water in fire suppression activities. 2. Comprehend the design principles of fire service pumping apparatus. 3. Analyze community fire flow demand criteria. 4. Demonstrate, through problem solving, a thorough understanding of the following: <ul style="list-style-type: none"> • Hydrostatics • Water characteristics • Principles of fluid pressure • Hydrokinetics • Bernoulli's formula • Nozzle reaction • Friction loss in water conductors • Nozzle pressure equation • Water distribution systems • Hazen-Williams equation • Fire flow tests • Determination of required fire flow • Fire service pump design and testing • Friction- loss calculations • Engine and nozzle pressure • Underwriter's formula • Parallel lines • Wyed lines • Aerial stream calculations • Relay pumping • Mobile water supply • Fire streams • Four hydraulic laws of friction loss • Fire-fighting foams and foam systems |
| References: | |
| Assessment: | Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor. |

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| Name: | Building Construction for Fire Protection |
| Course Description: | Studies the components of building construction that relate to fire and life safety. The focus of this course is on fire fighter safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, preplanning fire operations, and operating at emergencies |
| Prerequisite: | Completion of Fire Protection Fundamentals or instructor approval. |
| Outcomes: | <ol style="list-style-type: none"> 1. Demonstrate an understanding of building construction as it relates to firefighter safety, buildings codes, fire prevention, code inspection and firefighting strategy and tactics. 2. Classify major types of building construction. 3. Analyze the hazards and tactical considerations associated with the various types of building construction. 4. Explain the different loads and stresses that are placed on a building and their interrelationships. 5. Identify the principle structural components of buildings and demonstrate an understanding of the functions of each. 6. Differentiate between fire resistance and flame spread, and describe the testing procedures used to establish ratings for each. 7. Classify occupancy designations of the building code. 8. Identify the indicators of potential structural failure as they relate to firefighter safety. |
| References: | |
| Assessment: | Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor. |